Exercise-I (Conceptual Questions) Build Up Your Understanding

AMINE

1. Among the following which one is not formed in Hoffmann degradation

(1) RNCO (2) $R-\ddot{N}H_2$

(3) $RCO\ddot{N}H\,Br$ (4) RNC

2. $CH_3CH_2CONH_2 \xrightarrow[Br_2]{NaOH} A$,

Aqueous solution of A

(1) Turns blue litmus to red

(2) Turns red litmus to blue

(3) Does not affect the litmus

(4) Decolourise the litmus

3. Ethanamine can be obtained if the following compound is heated with [KOH + Br_2]

(1) Ethanamide (2) Methanamide

(3) Propionamide (4) All the above

4. $CH_3CONH_2 \xrightarrow[I]{P_2O_5} A \xrightarrow[II]{Na/EtOH} B$

Reaction II is called

(1) Clemmensen

(2) Stephen

(3) Mendius

(4) Bouveault–blanc reduction

5. Tertiary amine is obtained in the reaction :-

(1) Aniline $\xrightarrow{CH_3I}$ $\xrightarrow{CH_3I}$

(2) Aniline $\xrightarrow{CH_3I}$

(3) Nitrobenzene $\xrightarrow{Sn/HCl}$

(4) None of the above

6. $C_2H_5NH_2$ cannot be prepared by the reduction of

(1) $C_2H_5NO_2$ (2) $CH_3CH{=}NOH$

(3) C_2H_5NC (4) CH_3CN

7. Gabriel reaction for the synthesis of amines, involves the use of

(1) 1° amide (2) 2° amide

(3) Imides (4) Aliphatic amide

8. Gabriel phthalimide reaction is used in the synthesis of

(1) Primary aromatic amines

(2) Secondary amines

(3) Primary aliphatic amines

(4) Tertiary amines

9. The reaction: [C_2H_5Br + NH_3] is in fact an example of

(1) Ammonolysis only

(2) Nucleophilic substitution only

(3) Ammonolysis as well as nucleophilic substitution

(4) None

10. Melting points are normally the highest for

(1) Tertiary amides (2) Secondary amides

(3) Primary amides (4) Amines

11. Solubility of ethylamine in water is due to

(1) Low molecular weight

(2) Ethyl group is present in ethyl alcohol

(3) Formation of H–bonding with water

(4) Being a derivative of ammonia

12. Which of the following compound liberates CO_2 when treated with $NaHCO_3$

(1) $CH_3COCH_2NH_2$ (2) CH_3NH_2

(3) $(CH_3)_4\overset{\oplus}{N}OH$ (4) $CH_3\overset{\oplus}{N}H_3Cl$

13. The product obtained by the alkaline hydrolysis of C_2H_5—NCO when treated with t–butyl magnesiumbromide, the compound obtained will be

(1) t–butylamine (2) n–butylamine

(3) Isobutane (4) n–butane

14. $C_2H_5NH_2$ → HNO_2 → a; C_6H_5CHO → b; NOCl → c; $C_6H_5SO_2Cl$ → d

Which product is a Schiff's base :-

(1) a (2) b (3) c (4) d

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15. Acidic nature of amino group is shown by the reaction :-

(1) $R–NH_2 + NOCl \rightarrow RCl + N_2 + H_2O$

(2) $2RNH_2 + 2Na \rightarrow 2RNH.Na + H_2$

(3) $R.CH_2NH_2 + HNO_2 \rightarrow R.CH_2OH + N_2 + H_2O$

(4) $R.NH_2 + HCl \rightarrow \overset{\oplus}{R}NH_3\ \overset{\ominus}{Cl}$

16. The reagent used in the conversion of $C_2H_5NH_2$ to C_2H_5Cl would be

(1) SO_2Cl_2 (2) $SOCl_2$ (3) NOCl (4) All

17. Hydrogen attached to nitrogen is released in the reaction

(1) $RCONH_2 + NaNH_2$ (2) $RNH_2 + Na$

(3) Both the above (4) None of the above

18. If primary amines are treated with ketones the product is

(1) Urea (2) Guanidine

(3) Amide (4) Schiff's base

19. Reactants of reaction – I are

CH_3CONH_2, KOH, Br_2

Reactants of reaction–II are

CH_3NH_2, $CHCl_3$, KOH

The intermediate species of reaction–I and reaction–II are respectively

(1) Carbonium ion, carbene

(2) Nitrene, carbene

(3) Carbene, nitrene

(4) Carbocation, carbanion

20. This compound does not respond to carbylamine reaction :-

(1) $CH_3–\underset{\underset{CH_3}{|}}{CH}–NH_2$ (2) $C_2H_5–NH–C_2H_5$

(3) $CH_3–\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}–NH_2$ (4) $CH_3–\underset{\underset{NH_2}{|}}{CH}–CH_2–CH_3$

21. Blue litmus can be turned to red by the compound

(1) ROH (2) RNH_2

(3) $\overset{\oplus}{R}NH_3\ OH$ (4) $\overset{\oplus}{R}NH_3Cl$

22. Which one of the following amine compound gives alcohol with HNO_2 :-

(1) N, N–Dimethylaniline

(2) Benzylamine

(3) N–methylaniline

(4) Aniline

ANILINE

23. $C_6H_5NH_2 \xrightarrow{Br_2/CCl_4}$? The product is :-

(1) Only o– bromoaniline

(2) 2, 4, 6–triboromoaniline

(3) o–and p–bromoaniline

(4) Only p–bromoaniline

24. Reaction $C_6H_5NH_2 + HAuCl_4 \longrightarrow [\overset{\oplus}{C_6H_5NH_3}]\overset{\ominus}{AuCl_4}$ shows ... behaviour of aniline:-

(1) Acidic (2) Neutral

(3) Basic (4) Amphoteric

25. Aniline on treatment with bromine water yields white precipitate of :-

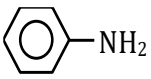
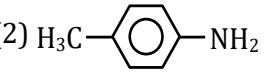
(1) o–Bromoaniline

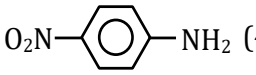
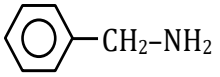
(2) p–Bromonailine

(3) 2, 4, 6–Tribromoaniline

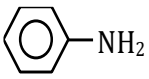
(4) m–Bromoaniline

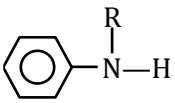
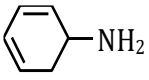
26. Which compound does not show diazo coupling reaction :-

(1)  (2) 

(3)  (4) 

27. Which of the following amines give N–nitroso derivative with $NaNO_2$ and HCl :-

(1) $C_2H_5NH_2$ (2) 

(3)  (4) 

28. Which of the following does not reduce Tollen's reagent :-

(1) CH_3CHO (2) HCOOH

(3) C_6H_5NHOH (4) $C_6H_5NH_2$

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29. Aniline can be obtained by :-
(1) Benzoyl chloride and ammonia
(2) Reduction of benzamide
(3) Phenol and ammonia in presence of $ZnCl_2$
(4) Benzoic anhydride and ammonia

30. Aniline on direct nitration produces :-
(1) o–Nitroaniline (2) m–Nitroaniline
(3) p–Nitroaniline (4) All

31. Nitration of acetanilide followed by hydrolysis gives
(1) o–Nitroaniline only
(2) p–Nitroaniline only
(3) o– & p–Nitroaniline
(4) o–Nitroanilinium ion

32. $C_6H_5NH_2 \xrightarrow[0-5°C]{NaNO_2/HCl}$ A, Which is the incorrect structure of the product 'A' :-
(1) $[C_6H_5–N=\overset{\oplus}{N}]\overset{\ominus}{Cl}$ (2) $[C_6H_5\overset{\oplus}{N}_2]\overset{\ominus}{Cl}$
(3) $[C_6H_5–\overset{\oplus}{N}\equiv N]\overset{\ominus}{Cl}$ (4) $[C_6H_5–N\equiv\overset{\oplus}{N}]\overset{\ominus}{Cl}$

33. Chloroform and ethanolic KOH is used as a reagent in the following reaction :-
(a) Hoffmann carbylamine reaction
(b) Hoffmann degradation reaction
(c) Reimer–Tieman reaction
(d) Hoffmann mustard oil reaction
Code is :-
(1) Only for a (2) Only for a and b
(3) Only for b and d (4) Only for a and c

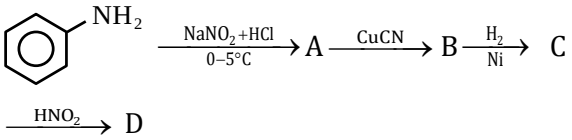
34. Acetanilide when treated with bromine in acetic acid mainly gives :-
(1) o–Bromoacetanilide
(2) N–Bromoacetanilide
(3) p–Bromoacetanilide
(4) m–Bromoacetanilide

35. Aromatic nitriles (ArCN) are not prepared by reaction
(1) ArX + KCN (2) $ArN_2^+ + CuCN$
(3) $ArCONH_2 + P_2O_5$ (4) $ArCONH_2 + SOCl_2$

TG: @Chalnaayaaar

NITRO GROUP, CYANIDE & ISOCYANIDE

36. Aniline in a set of reactions yielded end product D



The structure of the product D would be
(1) $C_6H_5CH_2OH$ (2) $C_6H_5CH_2NH_2$
(3) C_6H_5NHOH (4) $C_6H_5NHCH_2CH_3$

37. $\phi—X \xrightarrow{NaNO_2/HCl} C_6H_5N_2Cl \xrightarrow[\Delta]{Water} \phi—Y$,
In the above sequence X and Y are :-
(1) o–, p– and m–directing
(2) o–, p– and o–, p–directing
(3) m and m directing
(4) m and o, p directing

38. Which of the following compound gives an explosive on decarboxylation :-
(1) 2,4, 6–Trinitrobenzoicacid
(2) 2, 4–Dinitrobenzoicacid
(3) o–Aminobenzoicacid
(4) o–Hydroxybenzoicacid

39. The gas leaked from a storage tank of the Union Carbide plant in Bhopal gas tragedy was:-
(1) Methylisocyanate (2) Methylamine
(3) Ammonia (4) Phosgene

40. $CH_3–\underset{CH_3}{\overset{CH_3}{C}}–NC \xrightarrow{reduction} ?$

(1) $CH_3–\underset{CH_3}{\overset{CH_3}{C}}–NH_2$

(2) $CH_3–\underset{CH_3}{\overset{CH_3}{C}}–NH–CH_3$

(3) $CH_3–\underset{CH_3}{\overset{CH_3}{C}}–NH–CH_2CH_3$

(4) None

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41. Reaction of RCN with sodium and alcohol leads to the formation of :-

(1) $RCONH_2$ (2) $RCOO^-NH_4^+$

(3) RCH_2NH_2 (4) $R(CH_2)_3NH_2$

42. $C_6H_5NO_2 \xrightarrow{SnCl_2/HCl} A \xrightarrow[0°C]{NaNO_2/HCl} B$;

In the above sequence Benzene from B, is suitably obtained by using :-

(1) Ethanol (2) H_3PO_2

(3) Both the above (4) Methanol

43. Which reagent is used to get iodo benzene from benzene diazonium acid sulphate $[C_6H_5N_2HSO_4]$:

(1) CuBr, Δ (2) Cu powder + HI

(3) KI, Δ (4) None

44. Which of the following is used as a solvent in the Friedel–Crafts reaction :-

(1) Toluene (2) Nitrobenzene

(3) Benzene (4) Aniline

45. In the Sandmeyer's reaction, —N=N—X group of diazonium salt is replaced by :-

(1) Halide group (2) Nitro group

(3) —OH group (4) —$NHNH_2$ group

PHYSICAL PROPERTIES

46. Which of the following when heated with KOH and primary amine gives carbylamine test

(1) $CHCl_3$ (2) CH_2Cl_2

(3) CH_3OH (4) CCl_4

47. Chloroform reacts with aniline and aqueous KOH gives :-

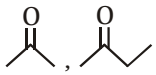
(1) Ph–N ≡ C (Phenyl isocyanide)

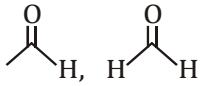
(2) Benzene

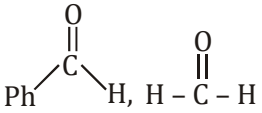
(3) Phenyl cyanide

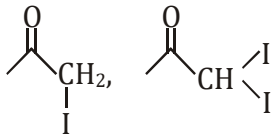
(4) None of these

48. Which of the following pair is differentiated by iodoform test?

(1) 

(2) 

(3) 

(4) 

49. Identify z in the following series

$CH_2=CH_2 \xrightarrow[\Delta]{HBr} x \xrightarrow{Hydrolysis} y \xrightarrow{I_2/NaOH} z$

(1) C_2H_5I (2) C_2H_5OH

(3) CHI_3 (4) CH_3CHO

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	2	3	3	1	3	3	3	3	3	3	4	3	2	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	3	3	4	2	2	4	2	2	3	3	4	3	4	3	4
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	3	4	4	3	1	1	2	1	1	2	3	3	3	2	1
Question	46	47	48	49											
Answer	1	1	2	3											

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Exercise-II (Previous Year Questions) AIPMT/NEET

AIPMT 2006

1. In a set of reactions propionic acid yielded a compound (D) ;

CH_3CH_2COOH (A) $\xrightarrow{SOCl_2}$ (B) $\xrightarrow[\Delta]{NH_3}$ (C) $\xrightarrow[Br_2]{KOH}$ (D), What is the structure of (D)

(1) $CH_3CH_2CH_2NH_2$ (2) $CH_3CH_2CONH_2$

(3) $CH_3CH_2NHCH_3$ (4) $CH_3CH_2NH_2$

AIPMT 2007

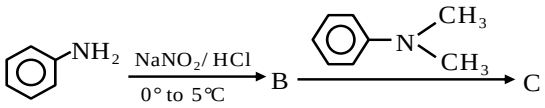
2. Which one of the following on reduction with $LiAlH_4$ yields a secondary amine

(1) Methyl isocyanide (2) Acetamide

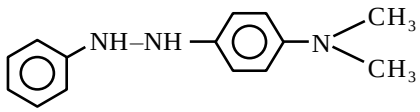
(3) Methyl cyanide (4) Nitro ethane

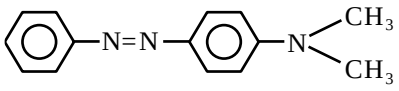
AIPMT 2008

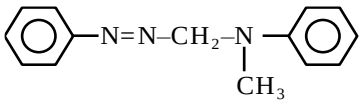
3. In a reaction of aniline a coloured product C was obtained.

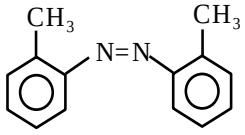


The structure C would be :

(1) 

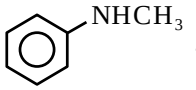
(2) 

(3) 

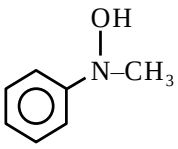
(4) 

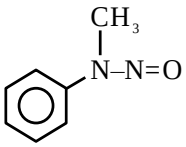
AIPMT 2009

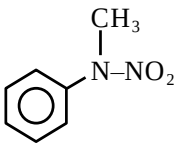
4. Predict the product :

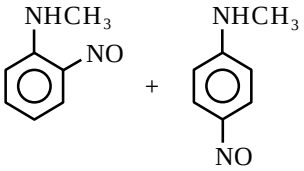


+ $NaNO_2$ + HCl ⟶ Product

(1) 

(2) 

(3) 

(4) 

AIPMT 2010

5. Which of the following statements about primary amines is 'False' ?

(1) Alkyl amines are stronger bases than ammonia

(2) Alkyl amines are stronger bases than aryl amines

(3) Alkyl amines react with nitrous acid to produce alcohols

(4) Aryl amines react with nitrous acid to produce phenols

6. Acetamide is treated with the following reagents separately. Which one of these would yield methyl amine ?

(1) PCl_5 (2) $NaOH/Br_2$

(3) Sodalime (4) Hot conc. H_2SO_4

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7. Match the compounds given in List–I with their characteristic reactions given in List–II. Select the correct option.

List–I (Compounds)

(a) $CH_3CH_2CH_2CH_2NH_2$

(b) $CH_3C{\equiv}CH$

(c) $CH_3CH_2COOCH_3$

(d) $CH_3CH(OH)CH_3$

List–II (Reactions)

(i) Alkaline hydrolysis

(ii) With KOH (alcohol) and $CHCl_3$ produces bad smell

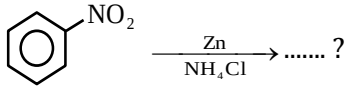
(iii) Gives white ppt. with ammonical $AgNO_3$

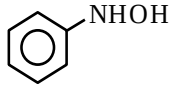
(iv) With Lucas reagent cloudiness appears after 5 minutes

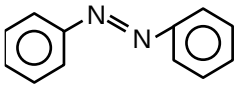
Options :

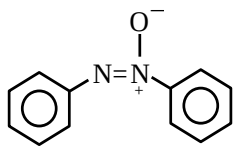
	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(i)	(iv)
(2)	(ii)	(iii)	(i)	(iv)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(ii)	(i)	(iv)	(iii)

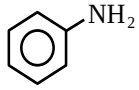
AIPMT Pre. 2011

8. What is the product obtained in the following reaction :  ..... ?

(1) 

(2) 

(3) 

(4) 

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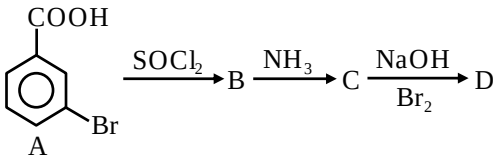
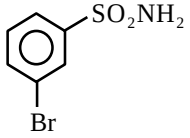
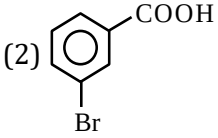
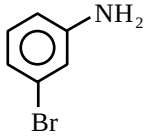
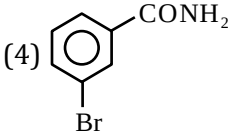
9. In a set of reactions m-bromobenzoic acid gave a product D. Identify the product D



(1) 

(2) 

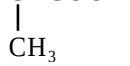
(3) 

(4) 

AIPMT Mains 2011

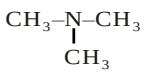
10. An organic compound 'A' on treatment with NH_3 gives 'B' which on heating gives 'C'. 'C' when treated with Br_2 in the presence of KOH produces ethylamine. Compound 'A' is :-

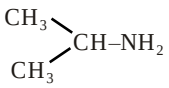
(1) CH_3CH_2COOH (2) CH_3COOH

(3) $CH_3CH_2CH_2COOH$ (4) 

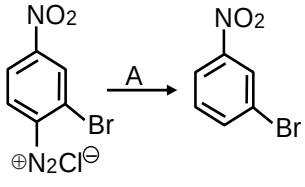
AIPMT Mains 2012

11. An organic compound C_3H_9N (A), when treated with nitrous acid, gave an alcohol and N_2 gas was evolved. (A) on warming with $CHCl_3$ and caustic potash gave (C) which on reduction gave isopropyl methylamine. Predict the structure of (A):

(1)  (2) $CH_3CH_2CH_2{-}NH_2$

(3)  (4) $CH_3CH_2{-}NH{-}CH_3$

NEET UG 2013

12. In the reaction  A is

(1) H^+/H_2O (2) $HgSO_4/H_2SO_4$

(3) Cu_2Cl_2 (4) H_3PO_2 and H_2O

13. Nitrobenzene on reaction with conc. HNO_3/H_2SO_4 at 80-100°C forms which one of the following products ?

(1) 1, 2, 4-Trinitrobenzene

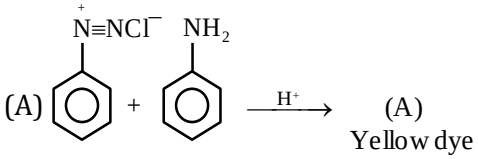
(2) 1, 2-Dinitrobenzene

(3) 1, 3-Dinitrobenzene

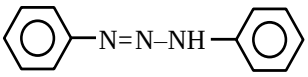
(4) 1, 4-Dinitrobenzene

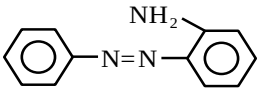
AIPMT 2014

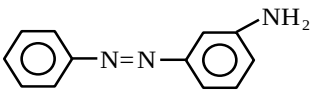
14. In the following reaction, the product

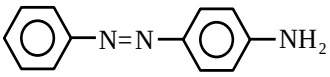


(A) is :-

(1) 

(2) 

(3) 

(4) 

15. Which of the following will be most stable diazonium salt $RN_2^+X^-$?

(1) $CH_3\ N_2^+X^-$ (2) $C_6H_5\ N_2^+X^-$

(3) $CH_3CH_2\ N_2^+X^-$ (4) $C_6H_5CH_2\ N_2^+X^-$

AIPMT 2015

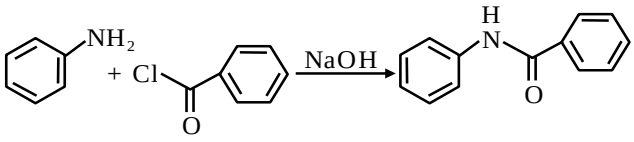
16. The electrolytic reduction of nitrobenzene in strongly acidic medium produces :-

(1) Azoxybenzene (2) Azobenzene

(3) Aniline (4) p-Aminophenol

RE-AIPMT 2015

17. The following reaction



is known by the name :

(1) Acetylation reaction

(2) Schotten-Baumann reaction

(3) Friedel–Craft's reaction

(4) Perkin's reaction

18. Method by which Aniline cannot be prepared is:-

(1) Reduction of nitrobenzene with H_2/Pd in ethanol

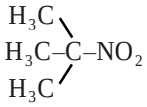
(2) Potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution

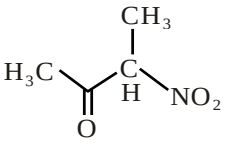
(3) Hydrolysis of phenyl isocyanide with acidic solution

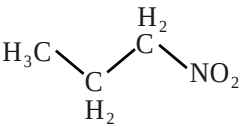
(4) Degradation of benzamide with bromine in alkaline solution

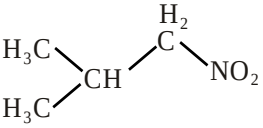
NEET-II 2016

19. Which one of the following nitro-compounds does not react with nitrous acid ?

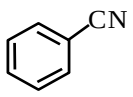
(1) 

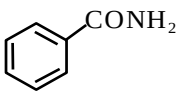
(2) 

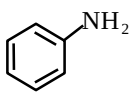
(3) 

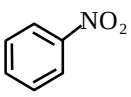
(4) 

20. A given nitrogen-containing aromatic compound (A) reacts with Sn/HCl, followed by HNO_2 to give an unstable compound (B). (B), on treatment with phenol, forms a beautiful coloured compound (C) with the molecular formula $C_{12}H_{10}N_2O$. The structure of compound (A) is :-

(1) 

(2) 

(3) 

(4) 

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NEET(UG) 2017

21. Which of the following reactions is appropriate for converting acetamide to methanamine ?

(1) Hoffmarnn hypobromamide reaction

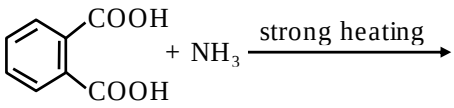
(2) Stephens reaction

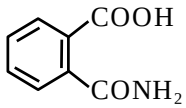
(3) Gabriels phthalimide synthesis

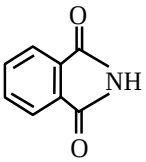
(4) Carbylamine reaction

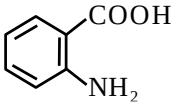
NEET(UG) 2019

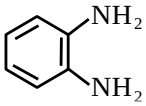
22. The major product of the following reaction is :



(1) 

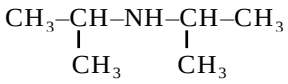
(2) 

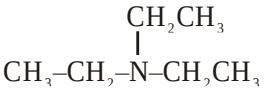
(3) 

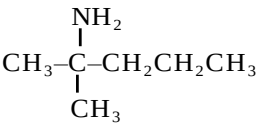
(4) 

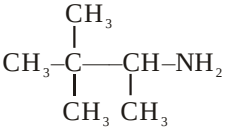
NEET(UG) 2019 (ODISHA)

23. The amine that reacts with Hinsberg's reagent to give an alkali insoluble product is:-

(1) 

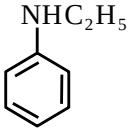
(2) 

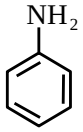
(3) 

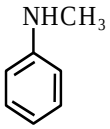
(4) 

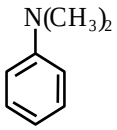
NEET(UG) 2020

24. Which of the following amine will give the carbylamine test?

(1) 

(2) 

(3) 

(4) 

NEET(UG) 2020 (COVID-19)

25. Reaction of propanamide with ethanolic sodium hydroxide and bromine will give

(1) Ethylamine

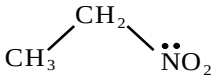
(2) Methylamine

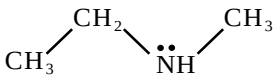
(3) Propylamine

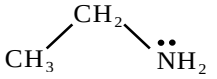
(4) Aniline

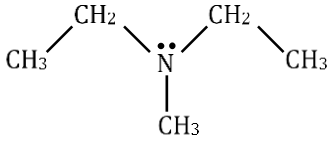
NEET(UG) 2021

26. Identify the compound that will react with Hinsberg's reagent to give a solid which dissolves in alkali :

(1) 

(2) 

(3) 

(4) 

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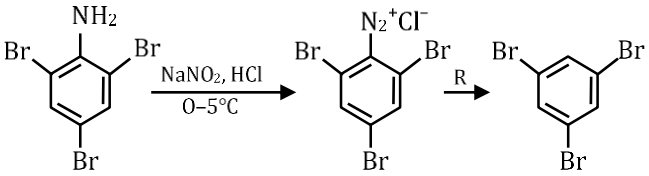
27. The reagent 'R' in the given sequence of chemical reaction is :



(1) H_2O (2) CH_3CH_2OH

(3) HI (4) CuCN/KCN

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	1	2	2	4	2	2	1	3	1	3	4	3	4	2
Question	16	17	18	19	20	21	22	23	24	25	26	27			
Answer	4	2	2	1	4	1	2	1	2	1	3	2			

TG: @Chalnaayaaar

Exercise-III (Analytical Questions) Master Your Understanding

1. $A \xrightarrow{NH_3} B \xrightarrow{\Delta} C \xrightarrow{Br_2+KOH} CH_3CH_2NH_2$

A is :-

(1) CH_3COOH (2) $CH_3CH_2CH_2COOH$

(3) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-COOH$ (4) CH_3CH_2COOH

2. The correct set of the prodsucts obtained in the following reactions

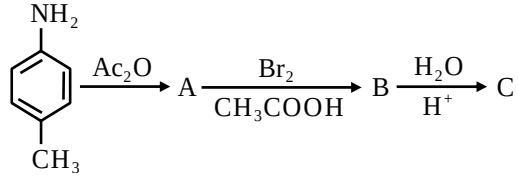
$RCN \xrightarrow{\text{reduction}} (A)$, $RCN \xrightarrow[(ii)H_2O]{(i)CH_3MgBr} (B)$,

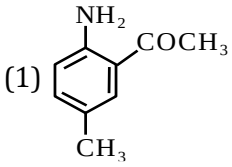
$RNC \xrightarrow{\text{hydrolysis}} (C)$, $RNH_2 \xrightarrow{HNO_2} (D)$

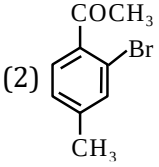
The answer is

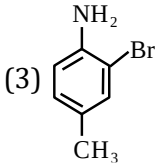
	A	B	C	D
(1)	2°Amine	Methyl ketone	1°Amine	Alcohol
(2)	1°Amine	Methyl ketone	1°Amine	Alcohol
(3)	2°Amine	Methyl ketone	2°Amine	Acid
(4)	1°Amine	Methyl ketone	2° Amine	Aldehyde

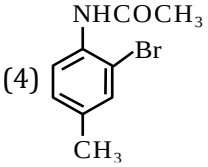
3. The final product C, obtained in this reaction would be



(1) 

(2) 

(3) 

(4) 

4. $C_2H_5Br \xrightarrow{AgCN} A \xrightarrow{H_3O^+} HCOOH + B$;

$B \xrightarrow[KOH]{CHCl_3} A \xrightarrow{\text{Reduction}} C$

A, B, C respectively in the above sequence are

(1) Ethane amine, methane nitrile and diethyl amine

(2) Carbyl amino ethane, ethane amine and primary amine

(3) Ethyl isocyanide, ethyl amine and methyl isocyanate

(4) Carbylamino ethane, ethanamine and ethyl methyl amine

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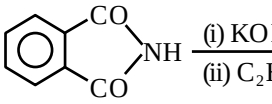
5. 

B and C in the above sequence are

(1) Benzoic acid + aniline

(2) Phthalic acid + ethylamine

(3) Phthalic acid + aniline

(4) Benzoic acid + ethylamine

6. The end–product in the reaction sequence would be :

Ethyl amine $\xrightarrow{HNO_2} A \xrightarrow{PCl_5} B \xrightarrow{NH_3} C$

(1) Ethyl cyanide (2) Ethyl amine

(3) Methyl amine (4) Acetamide

7. $A \xrightarrow{H_2NOH} B \xrightarrow{\text{reduction}} C \xrightarrow{NOCl} CH_3CH_2Cl$,

A and C in the above sequence respectively are:-

(1) Methanal, Methylamine

(2) Acetone, ethanamine

(3) Ethanal, dimethylamine

(4) Acetaldehyde, ethylamine

8. A compound of mol. wt. 180 gm is acetylated to give a compound of mol. wt. 390. The number of amino groups in the compound are :-

(1) 2 (2) 4 (3) 5 (4) 6

9. In the reaction sequence A, B and C are :-

$A \xrightarrow[HCl]{Sn} B \xrightarrow[0°C]{NaNO_2/HCl} C \xrightarrow{H_2O/\Delta} C_6H_5OH$

(1) Benzene, nitrobenzene, aniline

(2) Nitrobenzene, aniline and azo–compound

(3) Nitrobenzene, benzene, aniline

(4) Benzene, amino compound, aniline

10. Which one of the following tests can be used to identify primary amino group in a given organic compound

(1) Iodoform test

(2) Victor Meyer's test

(3) Carbylamine reaction

(4) Libermann's reaction

11. $CH_3Cl \xrightarrow{KCN} \xrightarrow{+4H} A \xrightarrow{NaNO_2/HCl} \text{Ethanol} + ?$

Apart from ethanol as the main product, the other products would be

(1) $H_2C=CH_2$ (2) CH_3CH_2-ONO

(3) CH_3CH_2-Cl (4) All the above

12. Identify B, X and R respectively in the following sequence of reactions

$C_2H_5MgBr \xrightarrow{ClCN} A \xrightarrow{H_3O^+} \boxed{B}$,

$CH_3COCH_3 \xrightarrow[NaOH]{I_2} \boxed{X} \xrightarrow{Ag} CH{\equiv}CH$

$C_6H_5NH_2 \xrightarrow[0-5°C]{NaNO_2/HCl} P \xrightarrow{CuCN} Q \xrightarrow[EtOH]{Na} \boxed{R}$

(1) C_2H_5COOH, CHI_3, $C_6H_5CH_2NH_2$

(2) C_2H_5COOH, CH_3I, C_6H_5COOH

(3) $C_2H_5CH_2NH_2$, CH_3I, C_6H_5COOH

(4) C_2H_5COOH, C_2H_5I, $C_6H_5CONH_2$

13. Using Fe/HCl, which one of the following reaction is possible [Here $\phi = C_6H_5$]

(1) $\phi-NO_2 \rightarrow \phi-NH-NH-\phi$

(2) $\phi-NO_2 \rightarrow \phi-NH_2$

(3) $\phi-NO_2 \rightarrow \phi-NHOH$

(4) $\phi-NO_2 \rightarrow \phi-N=N-\phi$

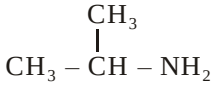
14. Total structural isomeric amines possible for molecular formula $C_4H_{11}N$

(1) 7 (2) 8 (3) 9 (4) 6

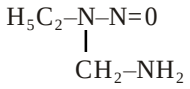
15. $C_2H_5NH_2 \xrightarrow{NOCl} A \xrightarrow{NaCN} B \xrightarrow{H_2/Ni} C$

what will be "C"

(1) $CH_3 - CH_2 - CH_2 - NH_2$

(2) 

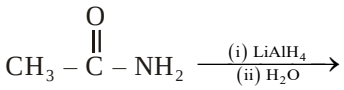
(3) $CH_3\,CH_2 - CH = NH$

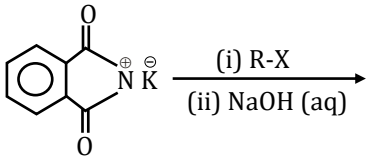
(4) 

16. Which of following will not gives only primary amine

(1) $C_2H_5X \xrightarrow{NH_3(Alc)}$

(2) $CH_3 - CN \xrightarrow[C_2H_5OH]{Na(Hg)}$

(3) 

(4) 

17. Basic nature of amine in aqueous medium can be explained by :-

(1) Inductive effect (2) Solvation effect

(3) Steric hinderance (4) All of these

18. Which of following is correct regarding basic nature:-

(1) $R - NH_2 > R_2NH > R_3N$ (Gaseous phase)

(2) $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$ (Aqueous solutions)

(3) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5{-}NH_2 > NH_3$ (Aqueous solutions)

(4) $(C_2H_5)_2NH > PhNH_2 > Ph - NH - CH_3$ (Aqueous solution)

19. What is decreasing order of H-bonding in water for alkyl substituted ammonium cation?

(1) $R\overset{\oplus}{N}H_3 > R_2\overset{\oplus}{N}H_2 > R_3\overset{\oplus}{N}H$

(2) $R_3\overset{\oplus}{N}H > R_2\overset{\oplus}{N}H_2 > R\overset{\oplus}{N}H_3$

(3) $R_2\overset{\oplus}{N}H_2 > R_3\overset{\oplus}{N}H > R\overset{\oplus}{N}H_3$

(4) $R_2\overset{\oplus}{N}H_2 > R\overset{\oplus}{N}H_3 > R_3\overset{\oplus}{N}H$

20. Which of following reaction is not acylation ?

(1) $C_2H_5NH_2 + CH_3{-}\overset{O}{\overset{\|}{C}}{-}Cl \longrightarrow$

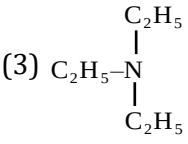
(2) $C_2H_5NH_2 + CH_3{-}\overset{O}{\overset{\|}{C}}{-}O{-}\overset{O}{\overset{\|}{C}}{-}CH_3 \longrightarrow$

(3) $C_2H_5NH_2 + CH_3\overset{O}{\overset{\|}{C}}{-}OCH_3 \longrightarrow$

(4) $C_2H_5NH_2 + CH_3{-}\overset{O}{\overset{\|}{C}}{-}OH \longrightarrow$

21. Which of following will not give acylation reaction?

(1) $H_5C_2 - NH_2$ (2) $H_5C_2 - NH - C_2H_5$

(3)  (4) $H_5C_6 - NH_2$

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22. Which of following is not correct match?

(1) $H_5C_2NH_2 + CH_3-\overset{O}{\overset{\|}{C}}-Cl \longrightarrow$

$H_5C_2-NH-\overset{O}{\overset{\|}{C}}-CH_3+HCl$

(Acylation)

(2) $H_5C_2NH_2 + H_5C_6-\overset{O}{\overset{\|}{C}}-Cl \longrightarrow$

$H_5C_2-NH-\overset{O}{\overset{\|}{C}}-C_6H_5+HCl$

(Benzoylation)

(3) $(H_5C_2)_2NH + CHCl_3 + 3KOH \longrightarrow H_5C_2-NC + 3KCl + 3H_2O$

(Carbyl amine reaction)

(4) $H_5C_2 - NH_2 + CH_3COOH \longrightarrow H_5C_2N^{\oplus}H_3\ CH_3COO^-$

(Salt formation or Neutralisation)

23. Which of following can be use to distinguish primary, secondary and tertiary amine?

(1) Carbyl amine reaction

(2) Reaction with Nitrous acid

(3) Reaction with Hinsberg's reagent followed by NaOH

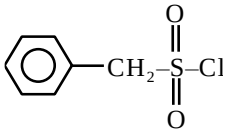
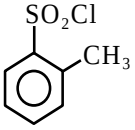
(4) Both 2 & 3

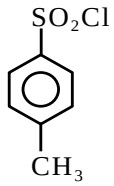
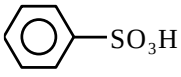
24. Which of following is insoluble in alkali?

(1) $H_5C_6-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}}-N(C_2H_5)-C_2H_5$ (2) $H_5C_6-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}}-N(H)-CH_3$

(3) $H_5C_6-\overset{O}{\overset{\|}{\underset{O}{\underset{\|}{S}}}}-N(H)-C_2H_5$ (4) All of these

25. These days benzene sulphonyl chloride replaced by which compound in Hinsberg test :-

(1)  (2) 

(3)  (4) 

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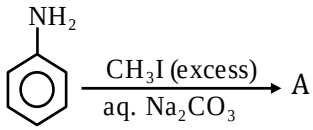
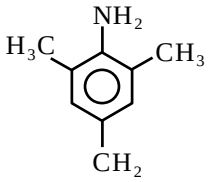
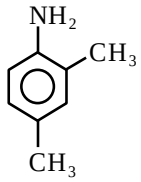
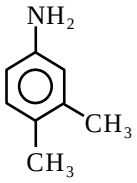
26. 

What will be "A"

(1)  (2) 

(3)  (4) $Ph-\overset{\oplus}{N}(CH_3)_3\overset{\ominus}{I}$

27. Total number of isomers of molecular formula C_3H_9N which will liberate N_2 gas on treatment with nitrous acid?

(1) 2 (2) 3 (3) 4 (4) 1

28. Which of following is water insoluble and stable at room temperature.

(1) $C_6H_5N_2^{\oplus}Cl^{\ominus}$ (2) $C_6H_5N_2^{\oplus}BF_4^{\ominus}$

(3) $C_6H_5N_2^{\oplus}HSO_4^{\ominus}$ (4) All

29. Which of following reaction do not displace N_2 from benzenediazonium salt?

(1) $ArN_2^{\oplus}Cl^- \xrightarrow{Cu_2Cl_2/HCl}$

(2) $ArN_2^{\oplus}Cl^- \xrightarrow{Cu/HCl}$

(3) $ArN_2^{\oplus}Cl^- + KI \longrightarrow$

(4) $ArN_2^{\oplus}Cl^- + HBF_4 \xrightarrow[\text{temperature}]{\text{Room}}$

30. Which of following group can not be introduced in the benzene ring by sandmeyer reaction?

(1) –Cl (2) –Br (3) –CN (4) –I

31. Formation of benzene from $C_6H_5N_2^{\oplus}Cl^-$ by use of C_2H_5OH is example of :-

(1) Redox reaction

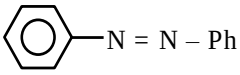
(2) Electrophilic substitution reaction

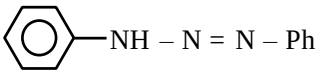
(3) Nucleophilic substitution reaction

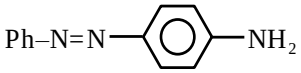
(4) Elimination reaction

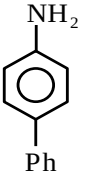
32. $A + HBF_4 \xrightarrow[\text{Temprature}]{\text{Room}} B \xrightarrow[Cu,\Delta]{NaNO_2} C \xrightarrow{Fe/HCl} D \xrightarrow[H^{\oplus}]{\Delta} E$

What is "E"

(1) 

(2) 

(3) 

(4) 

33. Diazo coupling reaction can be use to distinguish
(1) Aniline and Benzyl amine
(2) Ethylamine and N-methyl aniline
(3) Aniline and Phenol
(4) All of these

34. What is correct sequence of reagent to form 2,4,6-tibromofluorobenzene from Aniline?
(1) $NaNO_2/HCl$ (0-5°C), HBF_4/Δ, Br_2/H_2O
(2) Br_2/H_2O, $NaNO_2/HCl$ (0-5°C), HBF_4/Δ
(3) $NaNO_2/HCl$ (25°C), HBF_4/Δ, Br_2/H_2O
(4) Br_2/H_2O, $NaNO_2/HCl$ (0-5°C), HBF_4 (Room temperature)

35. Intermediates formed during reaction of $R-\underset{\underset{O}{\|}}{C}-NH_2$ with Br_2 and KOH are:
(1) RCONHBr and RNCO
(2) RNHCOBr and RNCO
(3) RNH—Br and RCONHBr
(4) $RCONBr_2$

36. $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-OH$ is obtained from following method
(1) $CH_3-CH_2-\underset{\underset{CH_3}{|}}{CH}-Cl + H_2O$
(2) CH_3CHO, CH_3-CH_2MgBr, H_2O
(3) H–CHO, $CH_3-\underset{\underset{CH_3}{|}}{CH}MgBr$, H_2O
(4) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-NH_2 + HNO_2$

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37. Match the column

	Column-I (Compound)		Column-II (Pkb)
(i)	N,N-Dimethyl aniline	(a)	9.38
(ii)	Benzenamine	(b)	8.92
(iii)	N-Methyl methanamine	(c)	3.38
(iv)	Methanamine	(d)	3.27

Correct match is -
(1) (i) → b, (ii) → a, (iii) → c, (iv) → d
(2) (i) → c, (ii) → d, (iii) → a, (iv) → b
(3) (i) → b, (ii) → a, (iii) → d, (iv) → c
(4) (i) → d, (ii) → a, (iii) → c, (iv) → b

38. Given below are two statements:
Statement-I : Aromatic amines are less basic than ammonia and aliphatic amine.
Statement-II : Generally in substituted aniline, it is observed that electron releasing groups increase basic strength whereas electron withdrawing groups decrease it.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement-I and Statement-II are correct.
(2) Both Statement-I and II are incorrect.
(3) Statement-I is correct but Statement-II is incorrect.
(4) Statement-I is incorrect but Statement-II is correct.

39. Some statements are given about following order of basic strength in aqueous medium.
$(CH_3)_2NH > CH_3-NH_2 > (CH_3)_3N > NH_3$
(a) More substituted ammonium ion gets stablised due to +I effect of alkyl group.
(b) The greater the size of ammonium ion, more will be solvation, so more stable ion so more basicity.
(c) More the alkyl groups, more steric hindrance to H-bonding in ammonium ion.
(d) Basic strength in aqueous medium is explained by more than one type of effects.

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Correct statements is/are

(1) a, b, c, d (2) a, b, d

(3) a, c, d (4) a and d only

40. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)**.

Assertion : Acylation of Amine by acetyl chloride is carried out in presence of base like pyridine

Reason : Pyridine removes HCl (by product) and shifts the reaction equilibrium to the left hand side.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

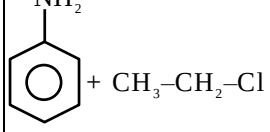
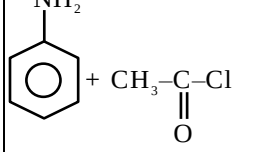
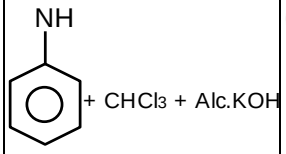
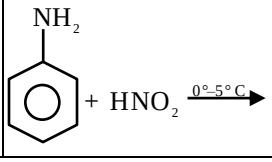
(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

(3) (A) is correct but (R) is not correct.

(4) (A) is not correct but (R) is correct.

41. Match the column

Column-I (Reaction)		Column-II (Process)	
(a)		(p)	Acetylation
(b)		(q)	Alkylation
(c)		(r)	Diazotization
(d)		(s)	Carbylamine reaction
		(t)	Halogenation

Correct match is

(1) (a) → (q), (b) → (p), (c) → (s), (d) → (r)

(2) (a) → (t), (b) → (p), (c) → (s), (d) → (r)

(3) (a) → (q), (b) → (p), (c) → (t), (d) → (s)

(4) (a) → (t), (b) → (q), (c) → (s), (d) → (r)

42. Given below are two statements:

Statement-I : The chemical reaction of Amines with benzene sulphonyl chloride in a different manner is used for the distinction of primary, secondary and tertiary amines and also for the separation of a mixture of these amines.

Statement-II : In the reaction with Tertiary amine, N, N-diethyl benzene sulphonyl amide is formed, which does not contain any acidic hydrogen hence insoluble in alkali.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

43. Given below are two statements:

Statement-I : If we have to prepare mono bromo aniline from aniline then the high activity effect of $-NH_2$ group is controlled by acetylation.

Statement-II : After acetylation, the lone pair of nitrogen of acetanilide is more available for donation to ring.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

TG: @Chalnaayaaar

44. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)**.

Assertion: The alkyldiazonium salt are unstable but the arenediazonium salt are stable for a short time at low temperature (0° – 5° C)

Reason: Due to resonance in arenediazonium salt carbon-nitrogen bond becomes stronger than alkyldiazonium salt.

In the light of the above statements, choose the **most appropriate** answer from the options given below:

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

(3) (A) is correct but (R) is not correct.

(4) (A) is not correct but (R) is correct.

45. Given below are two statements:

Statement-I : Aryl flouride and iodide cannot be prepared by direct halogenation of benzene.

Statement-II : These are easily obtained by reaction of Benzene diazonium salt with potassium iodide and with fluoroboric acid/Δ respectively.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

TG: @Chalnaayaaar

46. Match the column

Column-I Reaction		Column-II Name/Process	
(a)	$ArN_2^+X^- \xrightarrow[HCl]{Cu_2Cl_2}$	(P)	Gatterman reaction
(b)	$ArN_2^+X^- \xrightarrow{Cu/HCl}$	(Q)	Coupling reaction
(c)	$ArN_2^+X^- \xrightarrow[H_2O]{H_3PO_2}$	(R)	Sandmeyer reaction
(d)	$ArN_2^+X^- \xrightarrow[0°-5°C]{Ph-OH}$	(S)	Reduction

Correct match is -

(1) (a) → (R), (b) → (P), (c) → (S), (d) → (Q)

(2) (a) → (R), (b) → (P), (c) → (Q), (d) → (S)

(3) (a) → (P), (b) → (R), (c) → (S), (d) → (Q)

(4) (a) → (Q), (b) → (R), (c) → (P), (d) → (S)

47. Match the column

Column-I Type of amine		Column-II Reaction	
(a)	1° Amine	(P)	gives yellow oily liquid with HNO_2
(b)	2° Amine	(Q)	gives isocyanide test
(c)	3° Amine	(R)	not reacts with Hinsberg reagent

Correct match is -

(1) (a) → (P), (b) → (Q), (c) → (R)

(2) (a) → (R), (b) → (P), (c) → (Q)

(3) (a) → (Q), (b) → (P), (c) → (R)

(4) (a) → (Q), (b) → (R), (c) → (P)

48. Given below are two statements:

Statement-I : Direct nitration of aniline gives good yield of paranitroaniline.

Statement-II : By acetylation of aniline, formation of anilinium ion is decreased and good yield of meta product is obtained.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

TG: @Chalnaayaaar

49. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)**.

Assertion : Methyl amines react with benzoyl chloride to form N-methyl benzamide but forms salt with carboxylic acid.

Reason : Amines are base as well as nucleophile.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

(3) (A) is correct but (R) is not correct.

(4) (A) is not correct but (R) is correct.

50. Given below are two statements:

Statement-I : Aniline reacts with Bromine water to give a white precipitate of tribromoaniline.

Statement-II : Aniline gives monobromo aniline when reaction is carried out in following sequence.

(i) CH_3–COCl/pyridine

(ii) Br_2/CH_3–COOH

(iii) $H_3O^{\oplus}$

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

51. There are some reagents

(a) Et–X (b) KOH (c) $H_2O / \bar{O}H$

The sequence of reagents to get ethanamine from phthalimide is

(1) (i) - a, (ii) - b, (iii) - c

(2) (i) - b, (ii) - a, (iii) - c

(3) (i) - c, (ii) - a, (iii) - b

(4) (i) - b, (ii) - c, (iii) - a

52. Given below are two statements:

Statement-I : Reduction of ester with (i) $LiAlH_4$ (ii) H_2O gives 1° Alcohol while reduction of Amide gives 1° Amine

Statement-II : Hoffmann bromamide degradation gives 1° Amine not 2° Amine.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

53. **Statement-I :** Out of Butan-1-ol and butan-1-amine, Butan-1-ol is more soluble in water.

Statement-II : Alcohols are more polar than Amine so Amines form stronger intermolecular hydrogen bonds than alcohol.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement-I and Statement-II are correct.

(2) Both Statement-I and II are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

TG: @Chalnaayaaar

54. Given below are two statements; one is labelled as **Assertion (A)** and the other is labelled as **Reason(R)**.

Assertion : The correct boiling point order of isomeric amines is -

Primary > Secondary > Tertiary

Reason : The intermolecular H-bonding in primary amine is maximum due to two hydrogen available for more association but in tertiary amine there is no hydrogen available for H-bond.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A).

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

(3) (A) is correct but (R) is not correct.

(4) (A) is not correct but (R) is correct.

EXERCISE-III (Analytical Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	2	3	4	2	2	4	3	2	3	4	1	2	2	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	4	3	1	4	3	3	4	1	3	4	1	2	4	4
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	1	3	4	2	1	3	3	1	3	3	1	3	3	1	1
Question	46	47	48	49	50	51	52	53	54						
Answer	1	3	2	1	1	2	1	3	1						